

WHAT IS CLAIMED IS:

1. In combination for providing at selective positions on a patient's skin signals representing the patient's parameters at these positions,

an electrode constructed to be attached to the patient's skin at the
5 selective positions to provide signals indicative of the parameters on the patient's body at the selective positions,

an amplifier having an input terminal with an impedance approaching infinity and providing at the output terminal signals corresponding to the signals from the electrode, and

10 an output stage connected to the amplifier and constructed to reject noise and to pass signals at frequencies below a particular value.

2. In a combination as set forth in claim 1 wherein
a common mode rejection is provided to the signals from the electrode to eliminate noise from the signals from the electrode before the

15 introduction of the signals to the amplifier.

3. In a combination as set forth in claim 1 wherein
the input impedance of the amplifier is approximately 10^{15} ohms.

4. In a combination as set forth in claim 1 wherein
the impedance of the patient's skin is in a range to approximately 200
20 kilohms and wherein the electrode is attached to the patient's skin.

5. In a combination as set forth in claim 2 wherein
the input impedance of the amplifier is approximately 10^{15} ohms, and
wherein

the impedance of the patient's skin is in a range to approximately 200 kilohms, and wherein

the electrode is attached to the patient's skin.

6. In a combination for providing signal at selective positions on a patient's skin of the patient's parameters at the selective positions,
an electrode constructed to be applied to the selective positions of the patient's skin to provide a signal representative of the patient's parameters at these selective positions,

an amplifier connected to the electrode to amplify the signals at the electrode, and

a low pass filter connected to the amplifier to provide an output in which noise is eliminated and signals in a particular frequency range are passed by the low pass filter,

the amplifier having characteristics of providing a high input impedance and a low output impedance.

7. In a combination as set forth in claim 6 wherein the amplifier constitutes a differential amplifier for eliminating noise from the signals provided by the electrode.

8. In a combination as set forth in claim 6 wherein the amplifier includes a differential stage for eliminating noise from the signals provided by the electrode.

9. In a combination as set forth in claim 6 wherein the amplifier provides an input impedance approaching infinity.

10. In a combination as set forth in claim 6 wherein
the amplifier and the high pass filter are disposed on a printed circuit
board and the amplifier is isolated electrically from the high pass filter on the
printed circuit board.

5 11. In a combination as set forth in claim 9 wherein
the high pass filter limits the amplitude of the output from the high
pass filter to facilitate the operation of the amplifier in processing the signals and
wherein

the amplifier has a low output impedance.

10 12. In a combination as set forth in claim 6 wherein
the amplifier provides an input impedance approaching infinity, and
wherein

the amplifier and the high pass filter are disposed on a printed circuit
board and the amplifier is isolated electrically from the high pass filter on the
15 printed circuit board, and wherein

the high pass filter limits the amplitude of the output from the high
pass filter to facilitate the operation of the amplifier in processing the signals and
wherein

the amplifier has a low output impedance.

20 13. In combination for providing at selective positions on a patient's skin
signals representing the patient's parameters at these positions,

a first electrode constructed to be attached to the patient's skin at the
selective positions to provide signals representing the patient's parameters at these
positions,

a second electrode constructed to be attached to the patient's skin at positions different from the selective positions to provide reference signals,

amplifiers connected to the first and second electrodes and having properties of providing a high input impedance approaching infinity and having a
5 low output impedance, and

a high pass filter connected to the amplifiers for eliminating noise and for passing signals at relatively high frequencies.

14. In a combination as set forth in claim 13 wherein
the amplifiers are constructed to obtain the difference between the
10 signals on the first and second electrodes.

15. In a combination as set forth in claim 13 wherein
the amplifiers provide a differential relationship for eliminating noise.

16. In a combination as set forth in claim 13 wherein
the combination of the patient's skin and each individual one of the
15 electrodes has an impedance to approximately 200 kilohms and the amplifier has an input impedance of approximately 10^{15} ohms.

17. In a combination as set forth in claim 13 wherein
the combination of the patient's skin and each individual one of the
electrodes has an impedance to approximately 200 kilohms and the amplifier has an
20 input impedance of approximately 10^{15} ohms.

18. In a combination as set forth in claim 13 wherein
each of the amplifiers has an output impedance of approximately fifty
(50) ohms to seventy-five (75) ohms.

19. In a combination as set forth in claim 13 wherein
the amplifiers are constructed to obtain the difference between the
signals on the first and second electrodes and wherein
the amplifiers provide a differential relationship for eliminating noise.

5 20. In a combination as set forth in claim 19 wherein
the combination of the patient's skin and each individual one of the
electrodes has an impedance to approximately 200 kilohms and the amplifier has an
input impedance of approximately 10^{15} ohms

each of the amplifiers has an output impedance of approximately fifty
10 (50) ohms.

21. In combination for providing at selective positions on a patient's skin
first signals representing the patient's parameters at these positions,

a first electrode coupled to the patient's skin at one of the selective
positions for producing first signals representing the patient's parameter at this
15 position,

a second electrode coupled to the patient's skin at a position other than
the selective position for producing reference signals,

a first amplifier coupled to the first electrode for amplifying the first
signals, the first amplifier having an input impedance approaching infinity, and

20 a second amplifier coupled to the second electrode for amplifying the
second signals, the second amplifier having an input impedance approaching
infinity, and

a differential circuit connected to the first and second amplifiers to
eliminate noise and to produce an output signal representing the difference between
25 the first and second signals.

22. In a combination as set forth in claim 21 wherein
the first and second amplifiers have substantially identical
characteristics.

23. In a combination as set forth in claim 21 wherein
each of the amplifiers has an input impedance of approximately 10^{15}
ohms and having an output impedance of approximately 50 ohms to 75 ohms.

24. In a combination as set forth in claim 27 wherein the first and second
amplifiers have substantially identical characteristics.

25. In combination for providing at selective positions on a patient's skin
first signals representing the patient's parameters at these positions,
an electrode coupled to the patient's skin at one of the selective
positions for producing second signals representing the patient's parameters at this
position, and

an amplifier connected to the first electrode for amplifying the signals
from the electrode, the amplifier having an input impedance approaching infinity.

26. In a combination as set forth in claim 25 wherein
the amplifier has an input impedance of approximately 10^{15} ohms.

27. In a combination as set forth in claim 25 wherein
the amplifier has an output impedance considerably less than the input
impedance of the amplifier.

28. In a combination as set forth in claim 26 wherein
the amplifier has an output impedance of approximately 50 ohms to
75 ohms.

29. In a combination as set forth in claim 26,
a low pass filter coupled to the output of the amplifier to receive the
signals from the amplifier, and

a printed circuit board for holding the amplifier and the low pass filter
5 with the amplifier in physically and electrically displaced relationship to the low
pass filter.

30. In a combination as set forth in claim 29,
a second low pass filter connected between the electrode and the input
to the amplifier to pass signals below a particular frequency.

10 31. In a combination as set forth in claim 29 wherein
the differential circuit is a first differential circuit and is connected to
the outputs of the amplifiers to operate as a low pass filter for passing signals below
a particular frequency and to eliminate noise and wherein

a second differential circuit is connected between the electrode and
15 the amplifiers to operate as a low pass filter for passing signals below the particular
frequency and to eliminate noise.

32. In a combination as set forth in claim 1 wherein

the amplifier has an input and an output and wherein

the output stage is connected to the output of the amplifier and

20 wherein

a second stage is connected between the electrode and the input of the
amplifier and is constructed to reject noise and to pass signals at frequencies below
the particular value.

33 In a combination as set forth in claim 6 wherein

the amplifier has an input and an output and wherein

the low pass filter is a first low pass filter and is connected to the
output of the amplifier to provide an output in which noise is eliminated and signals

5 in the particular frequency range are passed by the low pass filter and wherein

a second low pass filter is connected between the electrode and the
input of the amplifier to eliminate noise and to pass signals in the particular
frequency range.

34. In a combination as set forth in claim 6 wherein

10 the first low pass filter operates on a differential basis and wherein

the second low pass filter operates on a differential basis.

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